

# Lifetime Wool: Twin Futures

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## ABSTRACT

The Lifetime Wool project has confirmed plot-scale observations that twin-bearing ewes produce fleeces of lower weight and lower tensile strength, while their progeny suffer high mortality, reduced weaning weight and produce less wool of higher diameter. However, improving ewe nutrition can improve the performance of twin bearing ewes and the future lifetime performance of their progeny.

## AIM

The Lifetime Wool project established 18 paddock-scale research sites in cooperation with wool producers across southern Australia to confirm the research results in commercial situations and to develop practical guidelines for ewe management during pregnancy and lactation.

## METHOD

Lifetime Wool is a national project developing ewe management guidelines for woolgrowers. The project comprised plot-scale research that determined the response in wool production of ewes and the lifetime performance of their progeny to graded levels of ewe nutrition at different stages of pregnancy (Thompson and Oldham 2004). The Lifetime Wool project also established 18 paddock-scale research sites in cooperation with wool producers across southern Australia.

Oldham et al. (2004) have described the protocol for each paddock-scale site. In brief, cooperators joined 1000 mixed aged adult Merino ewes in a single flock at day 0. Ultrasound scanning of the ewes at day 50 identified those ewes that had conceived during the first 21 days of joining. These ewes were then randomly split into 2 treatments receiving either high or low nutrition. The liveweight (LW) and condition score (CS) targets for the high and low nutrition treatments were based on the LW and CS profiles of the CS3 and 3000 kg DM/ha feed on offer, and the CS2 and 1100/1500 feed on offer treatments of the plot-scale experiments (Ferguson et al. 2004). The quantity and quality of wool produced by the ewes was measured on a random sample of 25 single and 25 twin-bearing ewes from each nutritional treatment. The carryover reproductive performance of the ewes was measured using ultrasound scanning after their following joining. Wool production and quality was measured on all progeny for each flock up to 2.5 years of age.

## RESULTS

### Condition Score & Liveweight

Ewes on high and low nutrition diverged by 0.8 of a condition score to produce an average 6.6kg difference in liveweight between high and low nutrition treatments at day 140. After lambing this difference decreased but never completely closed up by the following joining (day 365).

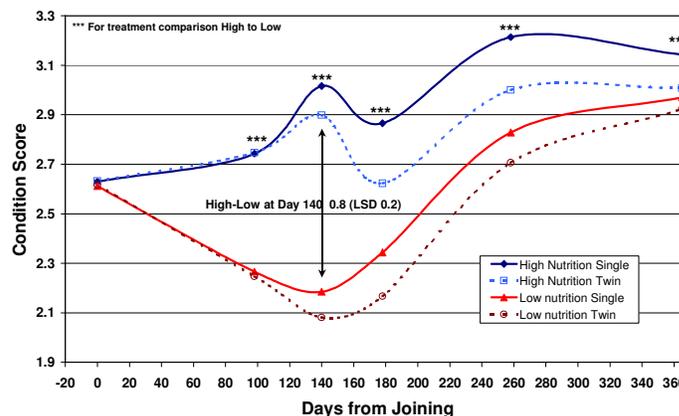


Figure 1. The average condition score profile of single and twin-bearing ewes managed on high or low nutrition across Lifetime Wool paddock scale sites in southern Australia.

## Ewe and Progeny Performance

Table 1 shows the impact of high and low nutrition on single and twin-bearing ewes and their progeny. Improved ewe nutrition during pregnancy led to higher condition score and live weight at lambing. This increased the fleece weight and fibre diameter of wool produced by commercial flocks of Merino ewes. Higher ewe live weight and condition score during pregnancy also increased survival of progeny, increased their wool production and reduced their fibre diameter. These results are consistent with the plot-scale observations that showed a strong relationship between live weight profiles and wool production of ewes and the subsequent lifetime performance of their progeny.

Twin-bearing ewes produced fleeces of lower weight, staple length and strength, while their progeny suffered higher mortality, reduced weaning weight and produced less wool of higher fibre diameter. Ewes that conceived and carried twins were more likely to have twins in subsequent years despite being slightly lower in condition score at the following joining. If twin-bearing ewes receive low nutrition the impact is additive and the ewe wool production and progeny performance results become worse. Conversely, better nutrition can improve twin performance. These results are consistent with Lifetime Wool plot-scale observations that showed a strong relationship between ewe parity and ewe wool production and the effects on lifetime performance of their progeny. The results show that there are opportunities to strategically manage twin-bearing ewes and their progeny for improved performance through better nutrition, particularly during mid and late pregnancy.

Table 1 The average performance of single and twin-bearing ewes and their progeny managed on high or low nutrition across Lifetime Wool paddock scale sites, in Southern Australia

Production Parameter	Ewe and Progeny Performance					
	Sites	Single		Twin		LSD (5%)
		High	Low	High	Low	
Average condition score at Day 140	15	3.0	2.2	2.9	2.1	0.2
Average live weight at Day140	15	56.2	49.7	60.5	53.9	2.1
Ewe clean fleece weight (kg)	15	3.4	3.0	3.3	2.8	0.1
Ewe mean fibre diameter ( $\mu\text{m}$ )	15	20.4	19.5	20.2	19.5	0.3
Ewe staple length (mm)	15	93.0	89.1	91.7	87.3	1.9
Ewe staple strength (N/ktex)	15	36.8	31.4	33.5	30.2	2.8
Average condition score at Day 365	15	3.1	3.0	3.0	2.9	0.08
Ewe carryover reproduction (scanning %)	15	123	116	135	133	7
Progeny survival to marking (%)	15	89.6	83.2	66.7	57.5	7.5
Progeny live weight at weaning (kg)	15	25.5	23.2	22.7	20.8	1.2
Progeny live weight at 12months (kg)	14	33.0	32.2	31.8	31.2	0.7
Progeny 1 <sup>st</sup> clean fleece weight (kg)	15	1.63	1.52	1.46	1.37	0.07
Progeny 2 <sup>nd</sup> clean fleece weight (kg)	10	2.99	2.93	2.83	2.75	0.06
Progeny 2 <sup>nd</sup> mean fibre diameter ( $\mu\text{m}$ )	10	18.38	18.49	18.65	18.79	0.14

## CONCLUSION

Twin bearing ewes and their progeny can suffer large performance deficits. However, improving twin ewe nutrition during pregnancy and lactation can substantially improve twin ewe and progeny performance. Further work is required on the extent to which twin ewe and progeny performance could be improved and whether it is economic to provide even higher levels of nutrition to twin ewes.

## KEY WORDS

Twins, Nutrition, Condition Score, Wool

## ACKNOWLEDGMENTS

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